# SESIÓN 5

**B06. Efectos bióticos del cambio del clima**
**B12. Afecciones sobre la salud humana**

## B6.3. LAND CAPABILITY EVALUATION AND CLIMATE CHANGE IMPACTS IN SEMIARID AND MEDITERRANEAN AREAS USING MICROLEIS DSS

(Shahbazi, F.[1,2], Jafarzadeh, A.[2], Sarmadian, F.[3], Neyshaboury, M.[2], Oustan, S.[2], Anaya-Romero, M.[1], Lojo, M.[1], de la Rosa, D.[1])

[1]Consejo Superior de Investigaciones Científicas (CSIC), Instituto de Recursos Naturales y Agrobiología de Sevilla (IRNAS)
Sevilla, España.
farzin@irnase.csic.es
[2]Soil Science Department. Faculty of Agriculture, Tabriz University.
Tabriz, Iran.
[3]Soil Science Department. Faculty of Agriculture, Tehran University.
Karaj, Iran.

Regional impact studies of the effects of future climate change are necessary because projected changes in meteorological variables vary regionally, and different climate systems can react in various ways to the same changes. In this study the effects of climate change on land capability are compared in two different climatological regions: Semi-arid, located in the south part of Ahar province (North western, Iran), and Mediterranean, located in the Eastern of Seville (South-western, Spain). In both areas, soils are depth, generally with a profile A-B-C, and farming is the main land use.

Land evaluation is a formal way to predict land capability by interactive changes in land use and climate. In this way, there were used two models included in the land evaluation decision support system for agricultural soil protection called MicroLEIS DSS. The models are Terraza and Cervatana. While Terraza gives an empirical prediction of the bioclimatic deficiency of a site, Cervatana model forecasts the general land use capability or suitability for a broad series of possible agricultural uses.

Two benchmark soil representative of each zone were selected, in the U.S. Soil Taxonomy these were classified as Inceptisol and Alfisol in Ahar, and as Vertisol and Alfisol in Seville area. Soil data were extracted from the soil data base of SEISnet for Seville area, and from the PhD thesis work of F. Shahbazi for Ahar zone. On the other hand, climate data were collected from weather stations located in both areas witch have more than 20 consecutive years of weather data concerning temperature and precipitation. Finally, climate data for a future scenario were collected from the Intergovernmental Panel on Climate Change (IPCC) for the projected changes in surface air temperature and precipitation for regions of Asia and Europe, and under scenario A1 (highest future emission) for 2080s. The land uses selected for evaluating were wheat, alfalfa, sugar beet, potato and maize. The evaluation

results show that by climate change, only wheat will be converted from moderate to good use capability in the study area of Ahar, while none of the crops will change its land capability in Seville area on the future scenario. For the present scenario, the modelling approach predicts that wheat has 0% of yield reduction in both areas, and this percentage will not vary on the future scenario. Alfalfa, has 40% and 50% of yield reduction respectively in Ahar and Seville area, and this coefficient will increase 10% by climate change. Sugar beet, has 60% and 40% of yield reduction respectively in Ahar and Seville area, and will increase in the same way as alfalfa by climate change. Concerning potato, the prediction assumes 0% of yield reduction on the present and future scenario in Seville zone while in Ahar this crop has 60% of yield reduction on the present conditions and increase 20% on the future sceneraio. Finally, maize, has 70% and 35% of yield reduction respectively in Ahar and Seville area, and this coefficient will increase 20% by climate change. This research work is integrated in the PhD work of F. Shahbazi, based on soil suitability in Ahar (Iran) using MicroLEIS DSS, to be presented in Tabriz University.